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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/543,165 Confirmation No. 7911  
Applicant : Ranganathan et al.  
Title : **HIGH TEMPERATURE AND HIGH HUMIDITY  
RELEASE COATING FOR POLYMER FILM**  
Filed : May 26, 2006  
TC/A.U. : 1791  
Examiner : Barbara J. Musser  
Docket No. : 63833/127  
Customer No. : 32642

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE TO OFFICE ACTION

Dear Sir:

In response to the Office Action of May 28, 2009, please amend the above-identified application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks/Arguments** begin on page 6 of this paper.

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### Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

Claim 1 (Original): A coating composition for use as a surface coating for polymer release films for use in at least one of high temperature and high humidity applications, which comprises a solution of at least one hydroxypropyl methylcellulose having hydroxypropyl molar substitution of from 0 to about 0.82 in combination with at least one water-borne fluorochemical additive selected from perfluoralkyl methacrylic acid copolymers.

Claim 2 (Original): A composition as claimed in claim 1, wherein the amount of the at least one hydroxypropyl methylcellulose having hydroxypropyl molar substitution of from 0 to about 0.82 comprises from about 27% to about 50% by weight of the solids in the solution, while the amount of the fluorochemical additive comprises from about 73% to about 50% by weight of solids in the solution.

Claim 3 (Original): A composition as claimed in claim 1, wherein the solution includes water and an organic solvent.

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Claim 4 (Original): A composition as claimed in claim 1, wherein the solution comprises alcohol and water and the amount of water in the solution may range from about 80% to about 10% by weight of total solution and the amount of organic solvent may range from about 20% to about 90% by weight.

Claim 5 (Original): A composition as claimed in claim 1, wherein the percent by weight solids in the solution is less than about 2% by weight.

Claim 6 (Currently Amended): A process for coating the surface of a polymer film to provide a release film for use in high temperature and/or high humidity conditions, which comprises coating at least one surface of the polymer film with a solution as claimed in claim 1 to provide a coating weight of from at least about 0.004 lb/ream to about 0.3 lb/ream per side and drying the coated film to set the coating. ~~In another embodiment of this process, the film is coated on both sides in separate passes or in a single pass to achieve the desired coating weight.~~

Claim 7 (Original): A process as claimed in claim 6, wherein the coating weight is from about 0.1 lb/ream per side to about 0.3 lb/ream per side.

Claim 8 (Original): A process as claimed in claim 6, wherein the release polymer film is coated on at least one surface.

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Claim 9 (Original): A process for curing rubber which comprises forming a sheet rubber layer in a calendar, laying layers of a release film obtained by the process of claim 6 between layers of the sheet rubber, tightly overwrapping the stack of layers with a release film or cloth, before subjecting the stack of layers to elevated temperature in a dry or steam oven wherein the sheet rubber or sheet molding compound is cured and subsequently unwrapping the stacked, cured sheets.

Claim 10 (Currently amended): A process for producing sheet molding composites which comprises:

- (a) casting a layer of heat-curable thermosetting resin, in fluid form, onto a continuously advancing polymeric release film;
- (b) introducing reinforcing material onto the advancing fluid layer;
- (c) laying a polymeric film obtained by the process of claim 6 on the top surface of said reinforced fluid layer thereby forming a sandwich composite;
- (d) advancing said sandwich composite through a series of kneading and compaction rolls; and
- (e) winding the sandwiched composite into a roll for partial curing; ~~the improvement comprising using a release film obtained by the process of claim 6.~~

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Claim 11 (Currently amended): A process for making thick molding composites, comprising:

- (a) introducing reinforcing material into a heat-curable thermosetting resin, in fluid form and mixing same until the material is mixed and wetted;
- (b) casting a layer of said mixture onto a continuously advancing polymeric film;
- (c) laying a polymeric film obtained by the process of claim 6 on the top surface of said reinforcing material-resin layer to form a sandwich composite;
- (d) advancing the sandwich composite through at least one compaction roll;
- and
- (e) cutting the continuous lengths of the sandwich composite into lengths for partial curing;

~~the improvement comprising using a release film obtained by the process of claim 6.~~

Claim 12 (New). The process of claim 6, wherein the film is coated on both sides in either separate passes or in a single pass to achieve the desired coating weight.

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### **REMARKS/ARGUMENTS**

This Amendment is submitted in response to the Office Action mailed May 28, 2009. At that time claims 1-11 were pending in the application. Claims 6-8 were rejected under 35 U.S.C. §112, second paragraph for being indefinite. Claims 1-11 were also rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,061,769 to Aharoni (hereinafter, "Aharoni"), in view of U.S. Patent No. 5,492,599 to Olson et al. (hereinafter "Olson") and U.S. Publication No. 2002/0136843 to Chopra et al. (hereinafter "Chopra"). By this Amendment, claims 6, 10 and 11 are amended. New claim 12 has been added. Exemplary support for new claim 12 can be found in original claim 6. Accordingly, claims 1-12 are presented for consideration by the Examiner.

### **Claim Rejections – 35 U.S.C. § 112**

Claims 6-8 stand rejected under 35 U.S.C. § 112, second paragraph, as failing to comply with the written description requirement.

Claim 6 has been amended to delete the second sentence.

Accordingly, the Applicants respectfully request that the rejection of claims 6-8 under 35 U.S.C. § 112, second paragraph, be withdrawn.

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### **Claim Rejections – 35 U.S.C. § 103**

Claims 1-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Aharoni in view of Olson and Chopra. See Office Action, page 2. Applicants respectfully traverse this rejection.

In order to reject a claim under §103, the Examiner must show that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. 35 U.S.C. §103(a). In making this determination, the Examiner must (1) determine the scope and content of the prior art; (2) ascertain the differences between the prior art and the claimed invention; (3) determine the level of ordinary skill in the pertinent art; and (4) evaluate evidence of secondary considerations. MPEP §2141; *Graham v. John Deere*, 383 U.S. 1 (1966). In determining the scope and content of the prior art and the differences between the prior art and the claimed invention, the Examiner has the burden of establishing a *prima facie* case of obviousness. MPEP §2142.

Independent claim 1 recites, *inter alia*, a coating composition for polymer release films for use in high temperature and humidity applications, which includes (1) a hydroxypropyl methylcellulose having hydroxypropyl molar substitution from 0 to about 0.82; combined with (2) a water-borne fluorochemical additive selected from perfluoroalkyl methacrylic acid copolymers.

Aharoni discloses copolymer compositions derived from (a) perfluoroalkyl acrylate or methacrylate, (b) acrylic, methacrylic or itaconic acid, and (c) a hydroxyl-

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containing acrylate or methacrylate. See Aharoni, Abstract. The Examiner recognizes that Aharoni does not disclose adding hydroxypropyl methylcellulose to the fluoropolymer. See Office Action, page 3.

Chopra discloses a release coating composition which includes a solution of a hydroxypropyl methylcellulose having hydroxypropyl molar substitution from 0 to about 0.82. See Chopra, Abstract. Chopra does not disclose a water-borne fluorochemical additive selected from perfluoroalkyl methacrylic acid copolymers.

A. No Reasonable Expectation of Success

Prior art references can only be combined to reject claims as *prima facie* obvious if there is a reasonable expectation of success. See MPEP §2143.02. In order to demonstrate a reasonable expectation of success, the Examiner must demonstrate that the combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *Id.* It is well known that chemical reactions are viewed as among the unpredictable arts. See MPEP §2164.03; see also *In re Fisher*, 427 F.2d 833, 839 (CCPA 1970).

The basis for the combination asserted by the Examiner is the teachings of Olson, which lists a number of useful release polymers, including those with fluoroalkyl groups. Olson teaches that carboxymethyl cellulose and methyl acrylate may also be used. See Olson, col. 2, line 44 to col. 3, line 11. However, nothing in the prior art predictably leads a skilled artisan to the particular combination of hydroxypropyl



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**methylcellulose** (with hydroxypropyl molar substitution from 0 to about 0.82) with **perfluoroalkyl methacrylic acid copolymers**. There is no basis for the skilled artisan to select the specific composition claimed. In fact, the references cited by the Examiner teach away from their combination. For example, Olson teaches that copolymerized monomers such as methyl acrylate, "do not substantially contribute to its release properties but *may* contribute to other properties such as film formation." Olson, col. 2, lines 61-65 (emphasis added). Furthermore, while Aharoni mentions that the disclosed compositions can be used for release coatings, the focus of Aharoni is for optical coatings (discussed in six different places in the reference). Consequently, the skilled artisan would not be lead to combine Chopra with a composition primarily directed to optical coatings to form a release film.

Therefore, given the unpredictability in the art and the teaching away in the references cited, there is no predictably reasonable expectation of success for the combination of Aharoni, Olson and Chopra, and *prima facie* obviousness has not been demonstrated. Withdrawal of the rejection is respectfully requested.

B. Unexpected Results

Evidence of unexpected advantageous properties, such as a superiority in a property of the claimed composition compared to the prior art, rebuts *prima facie* obviousness. MPEP §716.02(a). Furthermore, "[e]vidence of unexpected properties

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may be in the form of a direct or indirect comparison of the claimed invention with the closest prior art." MPEP §716.02(b).

The Applicants of the present application discussed at length the superiority of the claimed invention over the release films of the closest cited prior art Chopra. The following disclosure comes directly from paragraphs [0083] to [0095] of the corresponding published application:

Coated Product of Prior Art (U.S. application Ser. No. 09/909,746) [Chopra]: shows good release from Silicone rubbers (brown, red, grey), Neoprene, Viton, Nitrile and Butyl rubbers. [D]oes not release from tan and orange Silicone. [E]xtensive transfer of the coating onto the rubber in the case of Silicones (brown and red), Viton (black), Nitrile (Black and White), Neoprene (black), EPDM (black). [E]xtensive transfer in the case of white Nitrile sample hindering adhesion in double plying.

Coated Product of Invention: good release and minimum transfer at levels acceptable by visual inspection in all the above cases from the following rubber samples: Silicones (brown, red, orange, tan, grey) Vitons (black) Nitriles (black and white) Neoprene (black) EPDM (black) Butyl (natural and black). No adhesion issues in double plying in the case of white Nitrile.

As discussed in the present application, the release films of Chopra do not release from tan and orange silicone, and the coating transfers extensively for brown and red silicones, black Viton, black and white nitrile, black neoprene and black EPDM. On the other hand, embodiments of the claimed invention have good release and minimum transfer for all samples evaluated with Chopra. This is unambiguous evidence of unexpected results as compared to the prior art release films of Chopra.

Since these comparative examples were presented in the original application, which was accompanied by a declaration of the inventors, no new declaration is

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necessary in presenting this evidence of unexpected results. These data demonstrate the nonobviousness of the pending claims. The Examiner indicated that combination of the prior art references was proper because the fluoropolymer of Aharoni would increase the substrate strength of Chopra. However, there is nothing in Aharoni or Olson to suggest that adding a fluoropolymer would have the increased performance characteristics of Chopra as disclosed in the present application. Withdrawal of this rejection is respectfully requested.

#### Claims 2-11

Each of claims 2-11 depends from claim 1, either directly or indirectly, and thus includes all the limitations of claim 1. Therefore, for at least the reasons discussed above with respect to claim 1, the combination of Aharoni in view of Olson and Chopra, as proposed in the Office Action, fails to establish a *prima facie* case of obviousness. "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP §2143.03, citing *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). The Applicants thus respectfully request that the rejection of claims 2-11 under 35 U.S.C. § 103(a) also be withdrawn.

#### CONCLUSION

Applicants respectfully assert that claims 1-12 are patentably distinct from the cited references, and request that a timely Notice of Allowance be issued in this case. If

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there are any remaining issues preventing allowance of the pending claims that may be clarified by telephone, the Examiner is requested to call the undersigned.

Respectfully submitted,

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Paul S. Evans  
Reg. No. 36,130  
Attorney for Applicants

Date: August 21, 2009

STOEL RIVES LLP  
One Utah Center  
201 South Main Street, Suite 1100  
Salt Lake City, UT 84111  
Telephone: (801) 578-6933  
Facsimile: (801) 578-6999